25X1A

[redacted]3062-63
Copy 8 of 8

12 August 63

MEMORANDUM FOR THE RECORD

SUBJECT : OXCART Engine Second Stage Compressor Honeycomb Failure

25X1A REFERENCE : [redacted]3040-63, dated 8 August 1963 titled: "OXCART - Engine Foreign Object Damage"

1. As indicated in reference memorandum, J58 engines #226 and 228 sustained internally induced damage during ground running in aircraft #121 on 6 August. Inspection indicates that a compressor rub condition occurred whereby the second stage blade tips dug into the honeycomb shroud which forms the compressor outer case within which the rotor and blades rotate. Inspection has also determined that these engines had insufficient blade tip to honeycomb clearance and also that all other engines have the proper clearance.

2. Effective with the first Table III performance improvement engine #219, the above mentioned "tip clearance" was reduced from .050 inch to .030 inch for aerodynamic reasons. Four instances of rub occurred during initial "green" test at Hartford involving early Table III engines. A pilot lot engineering change was therefore implemented to increase the tip clearance from .030 inch to .050 inch. This change was incorporated on all engines showing any evidence of rub during inspection after test at Hartford. The change was not incorporated in engines #226 and 228, which were delivered with .030 inch tip clearance, because they did not evidence rub. This pilot lot change subsequently became a firm engineering change and is now incorporated on all other Table III engines. This means that all engines in the field have .050 inch minimum tip clearance except the "30K" engines prior to #219 which have .050 inch minimum tip clearance.

3. Two coincidences are associated with subject incident. The first is that neither engine sustained damage to the first stage compressor blades. This tends to confirm that the damages occurred internally and were not induced by foreign material. The second

25X1A

25X1A

coincidence is that both engines were damaged at the same point in time in spite of differing total time accumulated on each engine and that the damage occurred on the first run after engine inspection and reinstallation into the reconfigured inlet/nacelles. This tends to indicate that the malfunction although internal may have been triggered or aggravated by some new condition common to both engines. These engines had accumulated seven flights in this aircraft without incident prior to the inlet/nacelle modifications. It would be pure conjecture to state that the inlet/nacelle modifications had anything to do with the damage, however, the second coincidence is cause for some uneasiness and appears to warrant a close look at the inlet/nacelle modification in terms of FOD susceptibility and in terms of the possibility of increased vacuum imposed on the initial compressor stages during ground running already known to involve reverse airflows and high vacuum conditions. An unusually high vacuum could tend to raise the compressor honeycomb structure and decrease an already marginal tip clearance. The substance of this paragraph has been discussed with the Headquarters representative in the field.

25X1A

[redacted]
Aircraft Systems Division
(Special Activities)

25X1A

[redacted]:ASD/OSA:mvp (12 Aug 63)
Distribution:
Cy 1 - DD/S&T thru AD/OSA
2 - AD/OSA
3 - D/TECH/OSA
4&5 - ASD/OSA
6 - PS/OSA
7 - ASD/OSA (chrono)
8 - RB/OSA

Next 1 Page(s) In Document Exempt

Approved For Release 2002/10/16 : CIA-RDP63-00313A000500120073-4